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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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APPLE/FENWICK SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041			EXAMINER MITCHELL, JASON D	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/990,887

Applicant(s)

HAN ET AL.

Examiner

Jason Mitchell

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7 and 14-38 is/are rejected.
- 7) ☒ Claim(s) 2-6 and 8-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-884)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Page No(s)/Mail Date 4/8/02

DETAILED ACTION

This action is in response to a reissue request filed on 11/21/01.

Claims 1-38 are pending in this application.

Recapture

Claims 21-38 rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Pannu v. Storz Instruments Inc.*, 258 F.3d 1366, 59 USPQ2d 1597 (Fed. Cir. 2001); *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to claim subject matter that applicant previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope of claim subject matter surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

- The error being relied upon as the basis for reissue is the inclusion of the "means for creating a disk image" limitation in claim 1 (*see the oath filed 4/8/02*).

However, it was this feature that applicant relied upon for patentability (*see e.g.*

the 1st and 2nd full par. on pg. 4 of the response filed 7/98 in the original case).

Thus on its face the basis for the request seems to constitute impermissible recapture. Further, none of the newly submitted claims include this feature.

- Independent claims 21 and 25 do not include a feature relating to the mounting also previously argued (*see e.g. the 3rd full par. on pg. 4 of the response filed 7/98 in the original case*). Instead the claims only require the image is “capable of being read” which is broader than the scope previously argued.
- The response filed in the original case on 7/98 added the limitation that the disk image “is a virtual representation of said physical storage volume such that it includes volume format information”. None of claims 21-38 present this limitation. Specifically, claims 21-24 and 31-38 have no corresponding language, and claims 25 and 29-30 recite an image including format information, but do not indicate the image is a “virtual representation of [a] physical storage volume”¹.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 and 26-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

¹ Note that claims 26-28 as presented depend from claim 24 but it appears that this is the result of a typographical error and the applicants intended them to depend from claim 25. Either way claims 26-28 suffer the same problems as the parent claim.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim element "means for creating a disk image" is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to clearly link or associate the disclosed structure, material, or acts to the claimed function such that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function.

Specifically, the specification make several references to creating a disk image (*see e.g. col. 3, lines 55-58 "the controller 12 creates a disk image of a hard disk drive onto which the software bundle is to be downloaded"*) but fails to indicate what constitutes the "means" for creating the image. For example in col. 3, lines 55-58 the applicants indicate that a 'controller 12' creates the image but do not indicate what acts are performed to achieve this creation. In effect this discloses that software code (*acting on hardware*) performs the creation. Broadly disclosed 'software' is not sufficient to meet the burdens raised by an invocation of 35 USC 112 6th.

Applicant is required to:

(a) Amend the claim so that the claim limitation will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

- (b) Amend the written description of the specification such that it clearly links or associates the corresponding structure, material, or acts to the claimed function without introducing any new matter (35 U.S.C. 132(a)); or
- (c) State on the record where the corresponding structure, material, or acts are set forth in the written description of the specification that perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claims 2-15 depend from and incorporate the language of claim 1 and thus are rejected for the same reasons as claim 1.

Claims 26-28 each recite "the first format ... and the second format". There is insufficient antecedent basis for these limitations in the claims. It is believed claims 26-28 are intended to depend from claim 25 (*instead of claim 24 as presented*) which would provided the needed antecedent basis for the terms.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7, 14, 16, 20-25, 29-34, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,363,487 to Willman et al. (Willman) in view of US 5,414,850 to Whiting (Whiting).

Regarding Claim 1: Willman discloses a system for accessing computer-readable files stored on a source device comprising:

means for creating a representation of the source device (*col. 5, lines 59-60 "Fixed disks (or hard disks) may be partitioned into multiple volumes"*), wherein said source device is a physical storage volume on which said computer-readable files to be accessed are located (*Fig. 1A, Hard disk 120*), and for storing said disk image on a storage device that is accessible to remote computers (*col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*), wherein said representation is a virtual representation of said physical storage volume such that it includes volume format information that reflects the format of said physical storage volume (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"*), and which enables said representation to be mounted at each of said plurality of target computers (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"; col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*); and

a driver having access to file format information which enables said target computers to read files, which exhibit different file formats, contained on said disk image (col. 4, lines 44-47 “dynamically attaching file system drivers 254, 256, 258”; col. 22, lines 24-27 “each local FSD in the FSD chain”; note that here the container object (i.e. ‘the FSD chain’) constitutes a single driver with access to the information (i.e. ‘each local FSD’) allowing it to access multiple formats).

Willman does not explicitly disclose the drivers (col. 4, lines 44-47 “file system drivers 254, 256, 258”) residing at each of a plurality of target computers (*distinct from the source computer*), but does disclose mounting remote volumes (col. 4, lines 4-7 “may be coupled to any number of networks having servers which may operate in accordance with there own file systems”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote server (col. 4, lines 4-7 “networks having servers”) as a system similar to that explicitly described by Willman (col. 3, lines 67-col. 4, line 1 “various partitions of hard disk ... formatted in accordance with a number of files systems”). In such an environment the remote server would constitute the claimed source computer with image file (col. 3, lines 67-col. 4, line 1 “partitions ... with a number of files systems”) and the system performing the mounting would constitute the target computer with resident disk image drivers (col. 4, lines 44-47 “dynamically attaching file system drivers 254, 256, 258”). Further it would have been obvious to

connect multiple computers to the disclosed remote server. Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7 "servers which may operate in accordance with there own file systems"; col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126"*). In other words it would have been obvious to implement any number of computer according to the teachings of Willman and connect them to any other number of computers also implemented accordingly to Willman's teachings.

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote (virtual disk) device"*) using Whiting's disk images (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space

required at the remote node (*Whiting col. 1, line 65-col. 2, line 5 "To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive"*).

Regarding Claim 7: The rejection of claim 1 is incorporated; further Willman discloses said driver includes data pertaining to different types of file systems, to thereby enable said driver to access representations stored in different file formats respectively related to said different types of file systems (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"; col. 22, lines 24-27 "each local FSD in the FSD chain"*).

Regarding Claim 14: The rejection of claim 1 is incorporated; further Willman discloses said representation is stored on the storage device in a read/write format comprising a file which contains a copy of every logical address block in said physical storage volume, regardless of whether the blocks contain data (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"*).

Regarding Claim 16: Willman discloses a method for providing access to files stored on a source device, comprising the steps of:

creating a representation of said source device, wherein said source device is a physical storage volume which contains said files to be accessed by said remote computer (*col. 5, lines 59-60 "Fixed disks (or hard disks) may be partitioned into multiple volumes"*), and wherein said representation is a virtual representation of said

physical storage volume in that said representation includes volume format information that reflects the format of said physical storage volume (*col. 3, lines 67-col. 4, line 1* “*various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138*”);

generating a script file which includes an identification of said disk image (*col. 22, lines 19-23* “*The connection ... is also achieved through the DosFsAttach interface*”);

launching said script file at said remote computer (*col. 22, lines 24-27* “*When a local volume is first referenced, ... asks each local FSD in the FSD chain to accept the media*”); and

mounting, (*col. 4, lines 4-7* “*may be coupled to any number of networks having servers which may operate in accordance with there own file systems*”), the representation identified in said script file using a driver that has access to volume format information which is needed to mount files, exhibiting different file formats (*col. 4, lines 44-47* “*dynamically attaching file system drivers 254, 256, 258*”; *col. 22, lines 24-27* “*each local FSD in the FSD chain*”).

Willman does not explicitly disclose mounting the representation at a target computer (*distinct from the source computer*), but does disclose mounting remote volumes (*col. 4, lines 4-7* “*may be coupled to any number of networks having servers which may operate in accordance with there own file systems*”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (*col. 4, lines 4-7 "networks having servers"*) as a system similar to that explicitly described by Willman (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk ... formatted in accordance with a number of files systems"*). In such an environment the remote servers would constitute the claimed source computer with the storage volume representation (*col. 3, lines 67-col. 4, line 1 "partitions ... with a number of files systems"*) and the system performing the mounting would constitute the target computer (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*). Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7 "servers which may operate in accordance with there own file systems"; col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126"*).

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote*

(virtual disk) device”) using Whiting’s disk images (col. 1, line 65-col. 2, line 5 “a Compressed Disk Image File (CDIF), on the drive”). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (Whiting col. 1, line 65-col. 2, line 5 “To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive”).

Regarding Claim 20: The rejection of claim 16 is incorporated; further Willman discloses selectively storing said disk image in a storage medium device in a read/write format comprising a file which contains a copy of every logical address block in said physical storage volume, regardless of whether the blocks contain data (col. 3, lines 67-col. 4, line 1 “various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138”).

Regarding Claim 21: Willman discloses a system for accessing computer-readable files having a source computer and a target computer, the source computer comprising:

- a storage volume (Fig. 1A, Hard disk 120); and
- a memory for storing a representation of the storage volume (Fig. 1A, RAM 104; also see e.g. col. 7, lines 13-16 “the FAT ... retained in random access memory”), the representation including an representation of a plurality of computer-readable files stored on the storage volume (col. 5, lines 59-60 “Fixed disks (or hard disks) may be partitioned into multiple volumes”), at least two of the plurality of computer-readable files having different file formats (col. 3, lines 67-col. 4, line 1 “various partitions of hard disk

120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138”), each of which are capable of being read by a disk image driver (col. 4, lines 44-47 “dynamically attaching file system drivers 254, 256, 258”; col. 22, lines 24-27 “each local FSD in the FSD chain”; note that here the container object (i.e. ‘the FSD chain’) constitutes a single driver with access to the information (i.e. ‘each local FSD’) allowing it to access multiple formats).

Willman does not explicitly disclose the driver (col. 4, lines 44-47 “file system drivers 254, 256, 258”) residing at a target computer (distinct from the source computer), but does disclose mounting remote volumes (col. 4, lines 4-7 “may be coupled to any number of networks having servers which may operate in accordance with there own file systems”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (col. 4, lines 4-7 “networks having servers”) as a system similar to that explicitly described by Willman (col. 3, lines 67-col. 4, line 1 “various partitions of hard disk ... formatted in accordance with a number of files systems”). In such an environment the remote servers would constitute the claimed source computer with image file (col. 3, lines 67-col. 4, line 1 “partitions ... with a number of files systems”) and the system performing the mounting would constitute the target computer with resident disk image drivers (col. 4, lines 44-47 “dynamically attaching file system drivers 254, 256, 258”). Those of ordinary skill in the art would have

been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7 "servers which may operate in accordance with there own file systems"; col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126"*).

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote (virtual disk) device"*) using Whiting's disk images (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (*Whiting col. 1, line 65-col. 2, line 5 "To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive"*).

Regarding Claim 22: Willman discloses a system for accessing computer-readable files having a source computer and a target computer, the target computer comprising:
a processor (*Fig. 1A Microprocessor 102*); and

a memory, coupled to the processor (*Fig. 1A RAM 104*), for storing a driver (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*) that, when executed by the processor, enables a storage volume representation resident at the computer (*col. 5, lines 59-60 "Fixed disks (or hard disks) may be partitioned into multiple volumes"*) to be mounted at the target computer (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*), the representation including a plurality of computer-readable files stored on a storage volume coupled to the source computer, at least two of the plurality of computer-readable files having different file formats (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 ... formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"*), each of which are capable of being read by the driver (*col. 4, lines 59-68 "Once an FSD is installed and initialized, the kernel communicates with it in terms of logical request for file opens, reads, writes, seeks, closes, and so on"; col. 22, lines 24-27 "each local FSD in the FSD chain"; again note that here the container object (i.e. 'the FSD chain') constitutes a single driver with access to the information (i.e. 'each local FSD') allowing it to access multiple formats*).

Willman does not explicitly disclose the representation of the storage volume (*col. 5, lines 59-60 "Fixed disks ... partitioned into multiple volumes"*) residing at a source computer (*distinct from the target computer*), but does disclose mounting remote volumes (*col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (*col. 4, lines 4-7 "networks having servers"*) as a system similar to that explicitly described by Willman (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk ... formatted in accordance with a number of files systems"*). In such an environment the remote servers would constitute the claimed source computer with image file (*col. 3, lines 67-col. 4, line 1 "partitions ... with a number of files systems"*) and the system performing the mounting would constitute the target computer with resident drivers (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*). Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7 "servers which may operate in accordance with there own file systems"*; *col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126"*).

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote (virtual disk) device"*) using Whiting's disk images (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (*Whiting col. 1, line 65-col. 2, line 5 "To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive"*).

Regarding Claim 23: The rejection of claim 22 is incorporated; further Willman discloses the disk image is mounted at the target computer as a local volume having a file system format that is different than the file system format of the storage volume (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 ... formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"; col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*).

Regarding Claim 24: The rejection of claim 22 is incorporated; further Willman discloses the disk image is mounted at the target computer as a remote volume, which can be accessed by the target computer through a communication network (*col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*).

Regarding Claim 25: Willman discloses a system for accessing computer-readable files, comprising:

a source computer coupled to a first storage device (*Fig. 1A, Hard disk 120*) having a first file format and a second storage device having a second file format, the source computer further coupled to a memory for storing a multiple-format representation of the storage devices (*col. 5, lines 59-60 "Fixed disks (or hard disks) may be partitioned into multiple volumes"*), the multiple-format representation including information indicative of the first and second file formats (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"*); and

a computer coupled to a memory for storing a driver, the disk image driver capable of reading the first and second file formats when executed by a processor located at the target computer (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*; *col. 22, lines 24-27 "each local FSD in the FSD chain"*).

Willman does not explicitly disclose the driver (*col. 4, lines 44-47 "file system drivers 254, 256, 258"*) residing at a target computer (*distinct from the source computer*), but does disclose mounting remote volumes (*col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (*col. 4, lines 4-7 "networks having servers"*) as a system similar to that explicitly described by Willman (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk ... formatted in accordance with a number of files systems"*). In such an environment the remote servers would constitute the claimed source computer with image file (*col. 3, lines 67-col. 4, line 1 "partitions ... with a number of files systems"*) and the system performing the mounting would constitute the target computer with resident disk image drivers (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*). Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7 "servers which may operate in accordance with there own file systems"; col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126"*).

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote*

(virtual disk) device”) using Whiting’s disk images (col. 1, line 65-col. 2, line 5 “a Compressed Disk Image File (CDIF), on the drive”). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (Whiting col. 1, line 65-col. 2, line 5 “To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive”).

Regarding Claims 29 and 30: Willman discloses a method of accessing computer-readable files, comprising:

mounting a multiple-format representation of a storage volume created by a source computer (col. 4, lines 44-47 “dynamically attaching file system drivers 254, 256, 258”; col. 4, lines 59-68 “Once an FSD is installed and initialized, the kernel communicates with it in terms of logical request for file opens, reads, writes, seeks, closes, and so on”), the multiple-format representation including volume information describing a plurality of file system formats employed by one or more storage volumes (col. 3, lines 67-col. 4, line 1 “various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138”); and,

reading the volume information from representation (col. 4, lines 59-68 “Once an FSD is installed and initialized, the kernel communicates with it in terms of logical request for file opens, reads, writes, seeks, closes, and so on”).

Willman does not explicitly disclose reading the volume information (*col. 5, lines 59-60* “Fixed disks ... partitioned into multiple volumes”) at a target computer (*distinct from the source computer*), but does disclose mounting remote volumes (*col. 4, lines 4-7* “may be coupled to any number of networks having servers which may operate in accordance with there own file systems”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (*col. 4, lines 4-7* “networks having servers”) as a system similar to that explicitly described by Willman (*col. 3, lines 67-col. 4, line 1* “various partitions of hard disk ... formatted in accordance with a number of files systems”). In such an environment the remote servers would constitute the claimed source computer with image file (*col. 3, lines 67-col. 4, line 1* “partitions ... with a number of files systems”) and the system performing the mounting would constitute the target computer with resident disk image drivers (*col. 4, lines 44-47* “dynamically attaching file system drivers 254, 256, 258”). Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system which would have produced only the expected results (*col. 4, lines 4-7* “servers which may operate in accordance with there own file systems”; *col. 3, lines 36-46* “FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126”).

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote (virtual disk) device"*) using Whiting's disk images (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (*Whiting col. 1, line 65-col. 2, line 5 "To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive"*).

Regarding Claim 31: Willman discloses a system for accessing computer-readable files having a source computer and a target computer, the target computer comprising:

a processor (*Fig. 1A Microprocessor 102*); and

a driver that, when executed by the processor, enables a representation of a storage volume resident at the source computer to be mounted at the computer (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258*), the representation including a plurality of computer-readable files stored on a storage volume coupled to the source computer (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 may also be formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"*), the driver having access to the files stored on the

representation in different file formats (*col. 4, lines 59-68 "Once an FSD is installed and initialized, the kernel communicates with it in terms of logical request for file opens, reads, writes, seeks, closes, and so on"*).

Willman does not explicitly disclose the drivers (*col. 4, lines 44-47 "file system drivers 254, 256, 258"*) residing at a target computer (*distinct from the source computer*), but does disclose mounting remote volumes (*col. 4, lines 4-7 "may be coupled to any number of networks having servers which may operate in accordance with there own file systems"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the disclosed remote servers (*col. 4, lines 4-7 "networks having servers"*) as a system similar to that explicitly described by Willman (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk ... formatted in accordance with a number of files systems"*). In such an environment the remote servers would constitute the claimed source computer with image file (*col. 3, lines 67-col. 4, line 1 "partitions ... with a number of files systems"*) and the system performing the mounting would constitute the target computer with resident disk image drivers (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"*). Those of ordinary skill in the art would have been motivated to do so as a known and obvious means of implementing the disclosed system (*col. 4, lines 4-7 "servers which may operate in accordance with there own file*

systems"; col. 3, lines 36-46 "FIG. 1 shows a computer system 100 ... adapted for communicating with a network 126").

Further Willman does not disclose the representation of a storage volume is a disk image.

Whiting teaches representing a storage volume with a disk image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's remote storage devices (*col. 22, lines 9-11 "remote (virtual disk) device"*) using Whiting's disk images (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*). Those of ordinary skill in the art would have been motivated to do so in order to reduce the physical storage space required at the remote node (*Whiting col. 1, line 65-col. 2, line 5 "To implement data compression ... creating a ... a Compressed Disk Image File (CDIF), on the drive"*).

Regarding Claim 32: The rejection of claim 31 is incorporated; further Willman discloses the driver is adapted to provide to the target computer files in a file format utilized by the target computer (*col. 4, lines 59-68 "Once an FSD is installed and initialized, the kernel communicates with it in terms of logical request for file opens, reads, writes, seeks, closes, and so on"*).

Regarding Claim 33: The rejection of claim 31 is incorporated; further Willman discloses wherein the disk image driver is adapted to access files stored on the disk image in different file formats (*col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258"; col. 22, lines 24-27 "each local FSD in the FSD chain"*).

Regarding Claim 34: The rejection of claim 31 is incorporated; further Willman discloses the storage volume is formatted according to a disk operating system (DOS) (*col. 6, lines 4-6 "the FAT file system"*), and a disk drive at the target computer is formatted according to a Hierarchical File System (HFS) (*col. 8, lines 37-42 "The Fnode's allocation becomes the root for a B+ tree"; note that Willman's disks can each be represented by any known file system*).

Regarding Claim 35: The rejection of claim 31 is incorporated; further Willman discloses the storage volume is formatted according to HFS (*col. 8, lines 37-42 "The Fnode's allocation becomes the root for a B+ tree"*), and a disk drive at the target computer is formatted according to DOS (*col. 6, lines 4-6 "the FAT file system"*).

Regarding Claim 36: The rejection of claim 31 is incorporated; further Willman discloses the driver maintains a list of file formats that the disk image driver is capable of recognizing (*col. 22, lines 24-27 "the FSD chain"*).

Regarding Claim 37: The rejection of claim 31 is incorporated; further Willman discloses the disk image is mounted at the target computer as a local volume having a file system format that is different than the file system format of the storage volume (*col. 3, lines 67-col. 4, line 1 "various partitions of hard disk 120 ... formatted in accordance with a number of files systems as indicated by volumes 134, 136 and 138"; col. 4, lines 44-47 "dynamically attaching file system drivers 254, 256, 258).*

Regarding Claim 38: The rejection of claim 31 is incorporated; further Willman discloses the disk image is mounted at the target computer as a remote volume, which can be accessed by the target computer through a communication network (*col. 22, lines 9-11 "an FSD which uses a block device driver to do I/O to a ... remote (virtual disk) device"*).

Claims 15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,363,487 to Willman et al. (Willman) in view of US 5,414,850 to Whiting (Whiting) in view of US 5,604,906 to Murphy et al. (Murphy).

Regarding Claim 15: The rejection of claim 1 is incorporated; further Willman and Whiting do not explicitly teach the disk image in an uncompressed read/only format containing only used of physical storage

Murphy teaches a disk image is stored on the storage device in an uncompressed read/only format comprising a file which contains volume information and a copy of only those logical address blocks of the physical storage volume which contain data (*col. 7, lines 51-54 "This source image starts at the first block ... and continues up to and including the last used block"; note that no unused blocks are included*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made exclude unused data blocks from the drive image (*col. 1, line 65-col. 2, line 5 "a Compressed Disk Image File (CDIF), on the drive"*) as taught by Murphy (*col. 7, lines 51-54 "This source image starts at the first block ... and continues up to and including the last used block"*). Those of ordinary skill in the art would have been motivated to do so to further reduce the storage necessary to store the disk image.

Regarding Claim 17: The rejection of claim 16 is incorporated; further Willman and Whiting do not teach the script file includes an identification of an executable program to be run after the image is mounted.

Murphy teaches a script file which includes an identification of an executable program, and further including the step of running said program at the remote computer after mounting said disk image (*col. 5, lines 13-16 "new bundles can be downloaded ... and this updating can take place automatically"*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made include a script file as disclosed in Murphy (*col. 5, lines 13-16 "new bundles can be downloaded ... and this updating can take place automatically"*) in Willman's system. Those of ordinary skill in the art would have been motivated to do so to automate a software update (*Murphy col. 5, lines 13-16 "updating can take place automatically"*).

Regarding Claim 18: The rejection of claim 17 is incorporated; further Murphy teaches said program is an installer program which installs files from the mounted disk image onto the remote computer (*col. 3, lines 25-28 "utility ... to install software onto multiple storage devices"*).

Regarding Claim 19: The rejection of claim 16 is incorporated; further Willman and Whiting do not teach disk images are created and identified in said script file.

Murphy teaches a plurality of disk images (*col. 9, lines 21-23 "An alternative embodiment ... which includes multiple image devices"*) are created and identified in said script file (*Fig. 8, Create Image Drive 86*), and wherein all of the disk images identified in said script file are mounted at said remote computer (*Fig. 8, Block Transfer From Image To Target 92*).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create and mount image drives with a script as taught by Murphy (*Fig. 8*) in the system described by Willman (*Fig. 1A*). Those of ordinary skill in the art would have been motivated to do so in order to automate the process of creating and mounting multiple drives.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,363,487 to Willman et al. (Willman) in view of US 5,414,850 to Whiting (Whiting) in view of Official Notice.

Regarding Claim 26: The rejection of claim 24 is incorporated; further Willman discloses the first format is an uncompressed read/write format (*col. 4, lines 61-64* “logical requests for ... reads, writes”; note that Willman makes no mention of compressing the representations thus it is implicit that they are uncompressed).

Willman and Whiting do not explicitly teach a read/only format.

Official notice is taken that the read/only format was well known in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's storage volumes as read/only. Those of ordinary skill in the art would have been motivated to do so to protect the data from change.

Regarding Claim 27: The rejection of claim 24 is incorporated; further Willman discloses the first format is an uncompressed read/write format (*col. 4, lines 61-64 "logical requests for ... reads, writes"; note that Willman makes no mention of compressing the representations thus it is implicit that they are uncompressed*).

Whiting teaches a compressed format (*col. 2, lines 1-2 "a Compressed Disk Image File"*).

Willman and Whiting do not explicitly teach a read/only format.

Official notice is taken that the read/only format was well known in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's storage volumes as read/only. Those of ordinary skill in the art would have been motivated to do so to protect the data from change.

Regarding Claim 28: The rejection of claim 24 is incorporated; further Willman discloses the first format is uncompressed (*note that Willman makes no mention of compressing the representations thus it is implicit that they are uncompressed*).

Whiting teaches a compressed format (*col. 2, lines 1-2 "a Compressed Disk Image File"*).

Willman and Whiting do not explicitly teach a read/only format.

Official notice is taken that the read/only format was well known in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to represent Willman's storage volumes as read/only. Those of ordinary skill in the art would have been motivated to do so to protect the data from change.

Allowable Subject Matter

Claims 2-6, and 8-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art does not teach:

a disk image driver which contains an index which identifies correspondence between the address locations of a storage volume and the address locations in a disk image representing that storage volume.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (571)272-3728. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bullock Lewis can be reached on (571) 272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Mitchell/
Examiner, Art Unit 2193

/Lewis A. Bullock, Jr./
Supervisory Patent Examiner, Art Unit 2193